

## **APPENDIX 14**

### **WHEATFIELD FORK ASSESSMENT FINDINGS AND DETAILS**

#### **Fuller Creek**

- The Fuller Ck. sub-basin consists of steep, deeply incised terrain. Upper reaches are characterized by inner gorge ravines. In the lower reaches, there has been deep downcutting by Fuller Ck. between plateau areas of moderate to near level terrain upslope. The upper sub-basin including North and South Forks were mostly logged by between 1960 and 1964. The Lower reaches south of Fuller Mt. were logged during the mid to late 1950s (See Logging History Maps). Main haul roads were all built along the creek channel at the base of steep terrain. Large in stream landing complexes were built by filling the channel with wood debris chunks and topped with dirt. Skid trails were constructed in streams and draws, and surface flows were concentrated and diverted. The 1964 flood event caused massive erosion downcutting, slides, and washing of soil and debris into watercourses.
- Four large debris flows are apparent in the 1965 photos. These slides originate from areas that were severely disturbed by logging. By 1984 these slides are obscured by revegetation. Active landsliding is most abundant along the SF of Fuller. An unmaintained logging road parallels the creek on the north side. The road is generally 20-30' above the creek. The slopes are steep, large debris slides are very common. The road has been obliterated by debris slides. 1961 photos show minimal active slide movement prior to harvesting. The 1942 photos show dense mature wooded cover with no visibly active slides (W. Haydon, DMG). Similarly, the South Fork contained dense mature conifer cover, which was logged by 1964. To this day, sideslopes along the S.F. continue to discharge a variety of sediment in the creek. The roadbed is actually intercepting large volumes of sediment. Field inspection of two of the delivering debris slides revealed that the one consisted mainly of coarse gravel and the consisted mainly of crumbly shale that would readily decompose into fines. The streambed below these slides consisted of coarse gravel and cobbles and did not seem excessively sediment impacted (DMG NCWAP).
- In the North Fork, the main creek diverted onto the in-stream haul road during the 64 flood, causing an estimated one quarter mile section of the road to collapse into the creek (See Air Photo 2, CDF NCWAP).
- The 1964 storm surge smashed through two road crossing structures accessing a large in- stream landing complex in excess of two acres in size downstream of the NF/ SF confluence. Located at the base of a turn in the creek, peak flows cut through the landing creating a deep basin canyon on the discharge side (See Air Photo #1 CDF NCWAP). .
- By 1968, a massive debris slide breached two road spans contouring steep terrain in the South Fork. Starting from the Fuller Mt. Ridge, the slide mass rammed down onto the South Fork, creating a lake. This later breached, leaving a water-fall appearance in the channel (CDF NCWAP).
- The earliest documented fisheries survey in Fuller Ck. dates to summer, 1964. At this time, Rowell and Fox found the main stem Fuller Ck. (up to NF/SF) still supporting salmon and steelhead. Pools constituted 70% of the stream reach with a maximum pool depth of six ft. Fine sediment comprised 20% of the stream substrate. By 1971, Parke and Klamt found pools reduced to 40% of the reach, maximum pool depth at 4 ft., and silt and sand at 35%. Of total stream substrate.
- In 1964, Rowell found the North Fork still supporting salmon and steelhead but in rapid decline due to logging, reporting pools at 30% total reach, and 40% substrate consisting of sand and silt, deepest pools at 3 ft, and overstory canopy depletion by removal of riparian conifers. By 1971, Parke and Klamt found pools reduced to 25% of the stream reach of the NF, and maximum pool depth at 2 ft.
- In 1964, Rowell and Fox reported in the South Fork heavy sand deposits at 50% of the substrate among dense concentrations of jams, logging slash and debris. Pools had completely filled in with a maximum depth of 2 ft. and average depth of six inches. By 1971, Parke and Klamt reported some recovery in the SF to 15-20% favorable habitat by reach, maximum pool depth 2.5 ft., silt and sand comprising 50% of total substrate, but a water temperature of 78F. The 1964 flood may have flushed some of the logging debris downstream by 1971 since coho and steelhead counted at 100/100 ft. reach (P. Higgins compilation, 2001). .
- By 1996, Sotoyome reported the Main Stem Fuller comprised of 61% riffles and 39% pools, similar to the 1971 survey. In the NF, Sotoyome found pool frequency at 36% and maximum pool depth at 3 ft., and 68% shade canopy cover, indicating recovery from logging damage. In the SF, Sotoyome found pools had increased

to 35% reach and maximum depth at 4 ft. Only 37% of pools were greater than 2 ft. depth. Shade canopy cover measured at 59%. Cox (1989) found densities of steelhead juveniles at 53/100 ft. reach but a 1995 survey reported half this density (Cox, 1995). These factors indicate recovery, but slower compared to the NF (P. Higgins, 2001).

- Fuller Creek temperatures are warm, MWATs at five stations for 2000 and 2001 ranging from 59-66 F, and seasonal maxima ranging from 68-73 F. While most of the maxima at the Fuller Creek stations were below lethal, most of the MWATs were above the fully supportive range.
- In the lower sub-basin, Sullivan Ck. is noted as a current source of sediment to Fuller Ck. during peak flows (CFL 97-219). As a deeply incised canyon, the haul road was built directly up the creek. A major landing complex was built near the bottom of the canyon on the south bank of creek, due to the inability to put more landings in upstream because of the steep terrain. During the 1964 flood, Sullivan Ck. eroded down through this landing. At the confluence point with Fuller Ck, Sullivan Ck. meandered back and forth among deeper and widened aggraded substrate (See Air Photo 6). The 1961 photo shows the original near lineal and narrower drainage pattern in this same area prior to 64 flood (see Air Photo 7). The 1995 Sotoyome survey describes Sullivan Ck. in mid-recovery at 23% pools but 16% of the streambed was dry from aggregation. Average depth of pools was 2 ft. but 38% of pools were greater than 3 ft. deep. Canopy had recovered to 89%.
- The Gualala Watershed Restoration Council coordinated large scale road abandonment and drainage upgrade work in the Fuller Ck. basin during the mid 1990s. Streambank rehabilitation work has been carried out by J. Monchke during this time.

East and highest/ steeper reaches of the Fuller Ck. watershed more recently entered due to concentration of remnant stands left unreachable during the 1960s. Cable and sometimes helicopter yarding methods most frequently used (CFL THP 97-365).

Conversion of much of the area around Oak Ridge for grazing at NF Fuller, now in brush (THP 97-333).

Trees originally removed for conversion to grazing, Timber industry in these areas increased harvesting in the 1950s, creating a mixed use.

#### Tobacco Creek

- Tobacco Ck. at main stem Wheatfield, Mendocoma FFS, Annapolis Rd., mid section of watershed 7/22/00 Water T 20C 800 .A.M., 6:00 P.M. 25C, indicating temperature impairment.
- Main road built along Tobacco Ck. with series of landings in or adjacent to the main creek. The 1964 flood event incised each of these landings cutting deep vertical gorges and creating canyons on the discharge side (See Air Photo 32, CDF NCWAP).
- By 1964, harvest operations advanced east of the Tobacco Ck. area to the higher reaches of an adjacent larger order stream flowing down a ravine to Wheatfield Fk. The 1964 flood event triggered a long torrent slide all the way down the creek through a mature timbered tract discharging into Wheatfield Fk. By the late 1960s, a haul road was built over the torrent slide following the creek (CDF NCWAP).

#### Haupt Creek

- First logged in the late 1800s to early 1900s with steam donkeys. Ben May logging Co. Lumber Co. was the first major landowner. The lower portion of Haupt Ck. was logged during the late 1950s. (98-281, MRC). Most remaining areas upstream were logged by 1970.
- Coho were known to spawn and rear in Haupt Creek (Cox, 1994). The 1964 overall survey composition: steelhead, rainbow trout, stickleback, and a large population of roach. Abundance for steelhead fishes and rainbow trout- 25/100 ft. and roach 200/100 ft. Large amount of spawning and nursery areas are not being used because fish passage is hindered by barriers. Drying of stream in summer months could limit fisheries value, but due to the many pools, juveniles should survive. Haupt Creek could become a first class steelhead and coho producing stream (DFG, 1964)(DFG NCWAP).
- In 1964, Klamt and Pool describe the headwaters and lower reaches of Haupt Ck. "so aggraded from the previous logging that the stream flowed underground in places" Pools comprised 80% reach length, with maximum pool depth at 5 ft. Coho and steelhead equally abundant but at densities of 25/100 ft. Roach found at 200 per 100 ft. In 1970, Park and Klamt found that pools had declined to 60% stream reach, and maximum depth reduced to 3 ft. Coho salmon still noted in 1970 at densities of 25/ 100 ft., but only in the lower reaches. Steelhead had increased substantially to 500/ 100 ft in the lowest reach and 100/100 ft. further upstream.

Steelhead compete well in altered stream habitats (Higgins, 1995). The aggregation point causing subsurface stream flow in lower Haupt, had washed downstream by 1970. (P. Higgins Gualala Compilation, 2001).

- Coho was not observed in the middle reach during electrofishing conducted in October, 2001. The lower reach was dominated by steelhead young-of-the-year and roach, with sculpins, stickleback, steelhead 1+ and newts present (DFG, 2001). As noted in a 1964 stream report: Haupt Creek is polluted from siltation and slash from past logging operations (DFG NCWAP).
- Currently, the LP SYP describes the main channel of Haupt Ck. having relatively low structural diversity with long shallow stretches and only occasional pools. Heavy aggregation not indicated. Historically active landsliding has been limited to small (< 100' greatest dimension) events. Best ratings for spawning conditions of all tributaries to Wheatfield Ck (98-281, LP SYP). Currently, Coho are not found. Steelhead only (T. Wooster, F&G). Haupt Ck. is highly responsive to rainfall probably because of its steep narrow inner gorge (98-281 MRC). Major tributary Class II in lower south bank of Haupt, used as a skid trail prior to 1970, downslope of Tin Barn Rd.

#### North Fork Wheatfield (upstream from Toombs Creek)

- Downslope areas along the Main Stem N.F. Wheatfield, flanked by Bear and Gibson ridges, were tractor logged during the late 1950s. Upslope areas were logged by 1964. Tractor skid trails were excavated throughout deeply incised terrain along the N.F. No active slide areas are noted in 1942 photos. The 1964 photos show numerous steep inner channel debris slides along the N.F. among recently logged areas. During the 1964 flood, one watercourse diverted onto the haul road, discharging at the headwall of one the larger slides (See Air Photo 10). Another major watercourse diversion onto roads is noted in this area (See Air Photo 11, CDF NCWAP).
- Northeast corner of Wheatfield watershed logged 1991 thru 1997, most heavily roaded area. Remaining portion of this part of the watershed helicopter logged due to steep terrain. Ridge tops converted to orchards or vineyards.

#### Elk Creek

- Elk Creek, tributary to the higher reaches of N.F. Wheatfield, was used historically for livestock grazing known as the Tabor Ranch. Mixed conifer/ hardwood stand developed in response to clearing and burning operations with intent to convert to pastureland. Elk Ck. was heavily impacted by tractor operations in 1950s, 1960s. Upper segments of Elk Ck. were used as skid trails with instream landings at truck road crossings. Logging debris and soil placed in stream beds. Flushing of this material continues with peak flow events. Existing road adjacent to Class II abandoned with new road relocated to the ridgeline (93-436 CFL). Five stream diversions onto truckroads repaired (92-382). Streambank rehabilitation work directed by J. Monchke.

#### Toombs Creek

- Upper Wheatfield, Toombs Creek, timber harvested to convert to grazing land in larger areas of the subwatershed. Sedimentation and accumulation of organic debris in channels during original tractor logging during the late 1950s and 1960s (CFL 97-158). Conversions to pastureland have been the dominant form of historical use. Tractor skidding down watercourses removed overstory canopy cover with intent to maintain permanent conversion for grazing use.
- One channel type of B4 was electrofished and showed that roach dominated (134) with steelhead 1+ (25), steelhead young-of-the-year (18), stickleback (5), newt (5), and steelhead 2+ (2) present. A roach dominated community indicates impaired conditions (DFG NCWAP, 2001).

#### House Creek

- Coho were known to spawn and rear in House Creek (Cox, 1994). A 1965 survey found steelhead ranging from 75 to 125/ 100 ft. among near equal number of roach and stickleback along three sample reaches. No coho were reported in this 1965 survey. Pollution-Use by horses, cattle and sheep (DFG, 1965). A 1970 survey reported Coho at 25/ 100 ft. in the lowest sample reach. Steelhead –500+/100 ft. in lower sections and 100/100 ft. in upper section. Sheep in upper one mile of stream (DFG, 1970).
- The gate on a 4-5' high dam on house creek on Soper Wheeler property has been opened because the reservoir has been completely filled with bedload from upstream. Downstream of the dam the channel is incised to

bedrock, probably due to the depletion of bed and suspended loads. In a few areas along House Creek, remnant bedrock terraces –capped with cobble sized alluvium- are found above the channel (as much as 1-5-20' in one area)(DMG NCWAP).

- Downstream of the dam, House Creek, the bed changes dramatically from a shallow flat bottomed, fines-dominated condition to a bedrock terrace covered with cobbles coarse sands, and gravels. A large portion of the alluvium is out of the active channel. This terrace occurs approximately at the toe of a large active landslide. Some of the coarse material may have derived from the slide. The bedrock terrace may represent a localized uplift or tilting, perhaps due to deepseated forcing of the landslide against the bank. For example some slides move by rotational about a horizontal axis. So, in rotational slides, the toe area may become somewhat elevated. However; no attempt has been made to test these hypotheses Continued use by cattle has trampled the banks in some areas and may adversely contribute to the nutrient load –algae was noted to be common in pools in House Creek (DMG NCWAP).
- In the lowest reaches of House Ck. near Wheatfield Fk., roads were built up several Class I tributary watercourses during the late 1950s throughout a larger timbered tract flanked by Skyline Ridge. Peak flows during the 1964 flood removed several sections of the road (See Air Photo 27)(CDF NCWAP).
- In the highest reaches of the House Ck. basin, upstream of the confluence with both Brink and Cedar Cks., Douglas-fir tracts on north facing slopes were entirely removed during the mid 1950s. Long sections of riparian areas were entirely cleared of all overstory canopy cover with intent for conversion to pastureland. Lack of erosion control facilities created gully erosion noted in 1965 photos (CDF NCWAP).
- By 2001, Coho were not observed in the lower, middle and upper reaches during electrofishing conducted in October, 2001 (DF&G NCWAP). The lower reach was dominated by roach and stickleback with ammocete larvae, yellow-legged frogs, steelhead young-of-the-year and one 1+, crayfish and sculpin present. A roach dominated community indicates impaired conditions. The middle reach was heavily dominated by stickleback with roach, ammocete larvae, bullfrog larvae and steelhead young-of-the-year present. Steelhead 1+ were not observed. The upper reach was dominated by roach, with ammocete larvae, steelhead 1+, newts, yellow-legged frogs, and a western toad present. Steelhead young-of-the-year were not observed. Anchor worms were observed on steelhead inhabiting reaches 2 and 3. E-fishing crew noted excess sediment in all low velocity areas, cows in creek, extensive pig activity, lack of large woody debris and over 50 lamprey redds (DFG NCWAP, 2001).

#### Pepperwood Ck. (Tributary to House Ck.)

- In the headwaters of Pepperwood (Oak Mountain) landsliding is especially abundant, active, and complex. Downstream in map sections 15 and 16 the stream cuts into a broad alluvial terrace that is almost 900 feet wide at the confluence with Jim Creek. Much of terrace material is outside of the active channel. This terrace and those along House Creek seem to be isolated remnants of former drainage patterns and may even be related to isolated fluvial deposits along the crest of Kings Ridge about a mile to the south and elsewhere in the uplift. And so it is uncertain whether the coarse and locally abundant alluvial deposits and bedload result solely from sediment transport within the current stream network from the abundant landslides in the headwaters or from a former system that has been deranged by faulting and uplift and no longer operates (DMG NCWAP).
- Other abandoned areas have regenerated with young conifer/ hardwood overstory. Numerous active earthflows occur along large portions of channels, even more abundant are dormant earthflows that potentially could be reactivated. In each of these landslide-impacted reaches, the channels widen. (DMG NCWAP).
- One channel type of F4 was electrofished and showed that roach dominated (80) with steelhead young-of-the-year (28), steelhead 1+ (23), stickleback (6), unidentified tapole (6) and steelhead 2+ (2), and one ammocetes and crayfish present (DFG NCWAP).
- Vegetation has been shaped by repeated fires. Area entirely burned over in 1955, with other subsequent fires to present. Conversions to pastureland have been the dominant form of historical use. Tractor skidding down watercourses removed overstory canopy cover with intent to maintain permanent conversion for grazing use. In many areas, soil compaction by heavy cattle access has prevented timely reestablishment of overstory canopy cover of watercourses with recent abandonment of agricultural use (CDF NCWAP).